

## REMARKS

### Amended Claims 1, 3 through 9, 11 and 12

Claims 1, 3 through 9, 11 and 12 were rejected as anticipated by U.S. Patent No. 5,915,694 to Brum under 35 U.S.C. § 102(b). Examiner indicated that Dependent Claim 10 is allowable. Applicants have amended Independent Claim 1 which now includes all of the limitations of former Claim 10. Likewise, Claims 2 through 9, 11 and 12 are dependent on Claim 1 and include all its limitations. Therefore, Applicants submit that Claims 1 through 9, 11 and 12, as amended, are now in suitable form for allowance.

### New Claims 43 through 52 are Not Anticipated by Brum

Applicants add new claims 43 through 52 which add no new matter and submits that these claims are not anticipated by U.S. Patent No. 5,915,694 to Brum, and therefore, overcome the rejection of previous claims 1, 3 through 9, 11 and 12 under 35 U.S.C. § 102(b). "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP 2131.

First, Brum is directed to a pyrophoric flare. A pyrophoric flare is composed of a material that will ignite spontaneously when exposed to air. [William P. Henning Declaration, ¶ 4, attached hereto as *Exhibit I*] Pyrophoric flares are fast burning and produce a high intensity. [*Id.*] The decoy disks described in Brum comprise "a thin sheet of iron foil provided with a surface treatment which causes the extremely rapid oxidation thereof when exposed to air." The decoy disks

of Brum must be sealed within the body of the flare so that they will not ignite before deployment. [col. 2, ll. 13 – 20; col. 4, ll. 56-62]

Applicants' invention relates to pyrotechnic flares. [See Specification pp. 5, 12] Pyrotechnic flares require an ignition source to combust. [Henning Declaration, ¶ 5] Typically, pyrotechnic flares burn more slowly than pyrophoric flares. [Henning Declaration, ¶ 6] The flare of Brum burns "extremely rapidly." The pyrotechnic flare of Applicants' invention creates a high intensity infrared signature.

Second, the decoy disks of Brum are not permanently joined in a stack whereby said stack remains joined upon ejection from a flare launcher. On the contrary, in Brum deployment rods extend through the deployment disks as part of the deployment system. [col. 5, ll. 40-53] At the appropriate time during deployment, a deployment piston moves "along the deployment rods toward the aft end and effectively push[es] the decoy disks therefrom in succession." [col. 7, ll. 58-60] Applicants' flare pellet assembly is permanently joined and is ejected from the flare launcher as an assembly. [See Specification p. 15]

Third, the decoy disks of Brum do not have tapered edges which form grooves in the flare pellet assembly. The decoy disks of Brum are thin sheets of foil. [col. 2, ll. 13 – 20; col. 4, ll. 56-62] Pyrotechnic pellets such as Applicants' tapered pellets are substantially thicker than pyrophoric disks such as those utilized in Brum. [Henning Declaration, ¶ 8] The invention of Brum requires decoy disks which rapidly oxidize. The decoy disks of Brum are thin slices. It is undesirable for a pyrophoric disk as utilized in Brum to be a thick disk because the goal is for the disks to oxidize and burn extremely rapidly. [Henning Declaration, ¶ 9] Pellets with tapered edges are necessarily thicker than the pellets contemplated by the Brum patent because a certain thickness

is required to create a tapered edge. [Henning Declaration, ¶ 10] Pyrotechnic pellets are generally thicker than pyrophoric disks because pyrotechnic pellets burn more slowly than pyrophoric disks. [Henning Declaration, ¶ 8]

Brum does not disclose a plurality of ignitable pyrotechnic flare pellets arranged in a stack. It does not disclose a means for permanently joining said stack of said plurality of pellets whereby said stack remains joined upon ejection from a flare launcher. Brum does not disclose each of said plurality of pellets having tapered edges whereby the center of each of said plurality of pellets is thicker than the edges of the pellet. Because Brum does not disclose each and every element of Claim 43, it does not anticipate Applicants' invention. Claims 44 through 52 are dependent on Claim 43 and include all of the limitations of Claim 43. Claims 43 through 52 are not anticipated and should be allowed.

Claims 13 through 19 and New Claims 43 through 52 are Not Made Obvious by the Combination of Brum and Callaway

Claims 13 through 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Brum in view of U.S. Patent Application Publication 2007/0295236 by Callaway *et al.* Applicants respectfully traverse these rejections and submit that Claims 13 through 19 as amended are allowable. Additionally, Applicants add new claims 43 through 52 and submit that they are not obvious in view of Brum in combination with Callaway.

First, Callaway was filed on August 24, 2007. This application was filed on January 23, 2004. Callaway can not be cited as prior art barring Applicants' invention because Applicants' filing date predates Callaway's filing date; therefore, there is no evidence that the Callaway disclosure was known before Applicants' filing date.

Second, a *prima facie* case of obviousness has not been established. There are three criteria required to establish a *prima facie* case of obviousness. MPEP § 2142 (citing *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

First, there must be some suggestion or motivation, either in the references themselves or the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

*Id.* If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP 2143.01. Here, modification of the decoy disks of Brum to include the grooves in Callaway would render the flare of Brum unsatisfactory for its intended purpose; therefore, there is no suggestion or motivation to combine the references and a *prima facie* case of obvious has not been made.

Callaway is directed at a two phase pyrotechnic flare which utilizes two different pellet compositions to create an infrared emitting decoy flare. [¶ 0011] One type, the primer pellet, is composed of a fast burning pyrotechnic composition which ignites rapidly to create an intense infrared source. [¶ 0007] The other type, the spectral pellet, burns longer than the primer flare and has an intensity ratio similar to an intended target for a missile. [¶¶ 0007-0008] The flare pellet assembly of Applicants' invention utilizes pellets of a single composition which exhibit a high intensity and a faster burn time as compared with pellets of the same composition by increasing the exposed surface area without additional machining of the pellets. [See Specification, pp. 5-6, Figures 11 and 12]

The burn rate of the pellet of Callaway is increased by drilling a central hole in the pellet or drilling grooves in the side of the pellets. [¶ 0011] However, Callaway is drawn to a pyrotechnic pellet. In contrast, Brum is drawn to a pyrophoric disk. Drilling holes or grooves in the decoy disks of Brum would not increase the surface area of the pellet and provide better ignition which is the stated motivation for the combination. [¶16 Office Action mailed February 21, 2008] Drilling holes in the thin decoy disks of Brum would actually decrease the surface area. It is the presence of the pyrophoric material that causes rapid ignition when the pyrophoric decoy disks are exposed to air; therefore, reducing the surface area would not provide better ignition. [Henning Declaration, ¶ 12] It would not have been obvious to one of skill in the art to combine Brum and Callaway because the modification of Brum that is suggested would render the Brum flare unsatisfactory for its intended purpose. [Henning Declaration, ¶ 11]

Further, the machined grooves of Callaway are very different from the tapered grooves created between the pellets assembled in a stack in Applicants' invention. [Henning Declaration, ¶ 13] The holes and grooves of Callaway are added via an additional machining step after the pellets are formed. [Henning Declaration, ¶ 14] Adding holes and grooves to pellets after formation utilizing a secondary machining step weakens the structural integrity of the pellet. [Henning Declaration, ¶ 15] Applicant's pellets are formed with tapered edges. When the pellets are assembled, the space between each pellet defines a tapered groove. No additional machining is required. [Henning Declaration, ¶ 16] The omission of the machining step improves the structural integrity of the flare pellet. [Henning Declaration, ¶ 17]

Applicants have invented a novel pyrotechnic flare pellet assembly utilizing tapered pellets which increases the intensity of the flare without secondary machining or changing the

chemistry of the pellets. Neither Brum nor Callaway separately or together disclose all of the elements of Applicants' invention. Based on the foregoing remarks, Applicants request reconsideration and solicit a Notice of Allowance. If the Examiner feels that a telephone conference with Applicants' attorney would advance the prosecution of the application, he is invited to call the undersigned at 502.562.7319.

Respectfully submitted,

/sarah osborn hill/

Sarah Osborn Hill

Registration No. 55,267

Date: June 28, 2008

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# EXHIBIT 1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:

**DAVID W. HERBAGE, ET AL**

Filed: **January 23, 2004**

Serial No. **10/763,789**

For: **Stacked Pellet Flare Assembly and  
Methods of Making and Using  
the Same**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

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Confirmation No.: **7920**

Art Unit: **3641**

Examiner: **Lee, Benjamin P.**

Attorney Docket No.: **A310429.2US**

**DECLARATION OF WILLIAM P. HENNING**

I, William P. Henning ("Declarant"), hereby state as follows:

1. Declarant is currently a Senior Manufacturing Engineer with Kilgore Flares Co., LLC, the assignee in the above referenced application. Declarant obtained a B.S. in Chemistry in 1970 from the University of Maryland. He has thirty-eight (38) years of technical experience in the military ammunition and pyrotechnics industry. He has particular expertise in the disciplines of pyrotechnics mixing, large and small caliber ammunition assembly, as well as the manufacture of squibs, igniters, fuses, grenades and the casting of propellants. He also has extensive experience with the design and manufacture of decoy flares and countermeasures. A true and correct copy of the full curriculum vitae of Declarant is attached hereto as Exhibit A.
2. Declarant is competent to testify to the facts stated herein and has personal knowledge of such facts.



3. Declarant has extensive knowledge of and experience with countermeasure and decoy flare technology.

4. A pyrophoric flare is composed of a material that will ignite spontaneously when exposed to air. Pyrophoric flares are fast burning and produce a high intensity.

5. Pyrotechnic flares require an ignition source to combust.

6. Typically, pyrotechnic flares burn more slowly than pyrophoric flares.

7. Declarant has reviewed and is familiar with Applicants' U.S. Patent Application No. 10/763,789, U.S. Patent No. 5,915,694 to Brum and U.S. Patent Publication No. 2007/0295236 to Callaway *et al.*

8. Pyrotechnic pellets such as Applicants' tapered pellets are substantially thicker than pyrophoric disks such as those utilized in Brum. Pyrotechnic pellets are generally thicker than pyrophoric disks because pyrotechnic pellets burn more slowly than pyrophoric disks.

9. The invention of Brum requires decoy disks which rapidly oxidize. The decoy disks of Brum are thin slices. It is undesirable for a pyrophoric disk as utilized in Brum to be a thick disk because the goal is for the disks to oxidize and burn extremely rapidly.

10. Pellets with tapered edges are necessarily thicker than the pellets contemplated by the Brum patent because a certain thickness is required to create a tapered edge.

11. Drilling holes or grooves in the decoy disks of Brum would not increase the surface area of the pellet and provide better ignition which is the stated motivation for the

combination. The modification of Brum that is suggested would render the Brum flare unsatisfactory for its intended purpose.

12. Drilling holes in the thin decoy disks of Brum would actually decrease the surface area. It is the presence of the pyrophoric material that causes rapid ignition when the pyrophoric decoy disks are exposed to air; therefore, reducing the surface area would not provide better ignition.

13. The machined grooves of Callaway are very different from the tapered grooves created between the pellets assembled in a stack in Applicants' invention.

14. The holes and grooves of Callaway are added via an additional machining step after the pellets are formed.

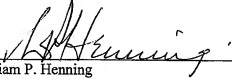
15. Adding holes and grooves to pellets after formation utilizing a secondary machining step weakens the structural integrity of the pellet.

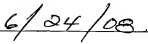
16. Applicants' pellets are formed with tapered edges. When the pellets are assembled, the space between each pellet defines a tapered groove. No additional machining is required.

17. The omission of the machining step in manufacturing Applicant's pellets improves the structural integrity of Applicant's flare pellet.

18. I hereby declare that all statements made herein are of my own knowledge, are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so

made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statement may jeopardize the validity of this application or any patent issued thereon.

  
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William P. Henning  
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Henderson, TN 38340

  
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DATE

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# **EXHIBIT A**

**Curriculum Vitae of William P. Henning.**  
**June 5, 2008**

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1480 Piney Grove Road  
Henderson, TN 38340

**Education.**

University of Maryland, College Park, MD. BSc. (Chemistry) 1970.  
Honors: Alpha Chi Sigma, Honorary Chemistry Fraternity, President 1969.

**Experience.**

**1993 to the present** - Kilgore Flares Co., LLC. Senior Manufacturing Engineer with responsibilities for Primer and Marine Location Marker production, assigned I R & D projects and composition mixing. Introduced several alternative compositions and mix methodologies in response to EPA promulgations.

**1990 – 1993** Talley Defense Systems Inc. Joliet Army Ammunition Plant, Joliet, IL. Project Engineer for the 155 mm Baseburner. Active in the facilitization of the plant, equipment acceptance/installation creation of procedural and government mandated documentation, Trained personnel in HTTB propellant casting, igniter mix preparation/pressing as well as LAP operations. Responsible for many rate improvement initiatives through the execution of three contracts.

**1983 – 1990** Honeywell Inc. Joliet Army Ammunition Plant, Joliet IL. Responsible for the supervision of six Manufacturing Engineers, in support of 30 mm GAU 8/A ammunition. Installed the second production line to meet capacity requirements. Was transferred to the Engineering Process Development Department and charged with the responsibility for bidding and proposal development. During this time interfaced with potential CONUS and European subcontractors (120mm Tank and Mortars).

**1977 – 1983** Bermite Division of Whittaker Corp. 22116 W. Soledad Canyon Rd. Saugus CA. Responsible for bidding and proposals, along with responsibility for series manufacture of detonators, igniters, Signals, fuses, propellant casting and chemical batch processing ( Red Phosphorus and MTV).

**1970 – 1977** Armscor PTY (Ltd), Lenz Facility, Johannesburg South Africa. Assisted in the rejuvenation of a WW II ammunition plant. Advanced from Production Superintendent to Production Manager of a multi caliber LAP Facility. Included were melt pour of shell, assembly of fuses, grenades, mines and ammunition.